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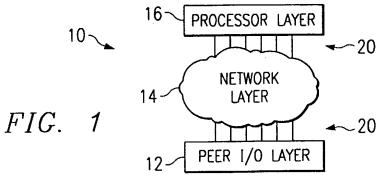
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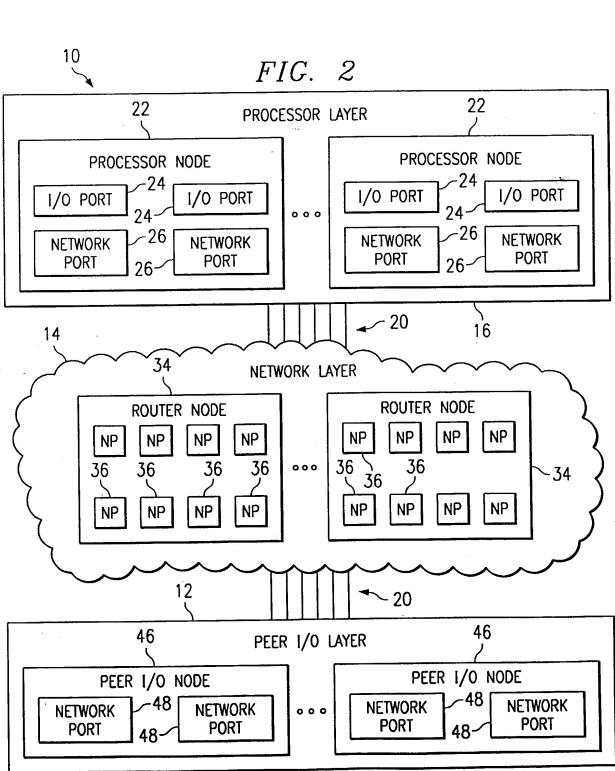
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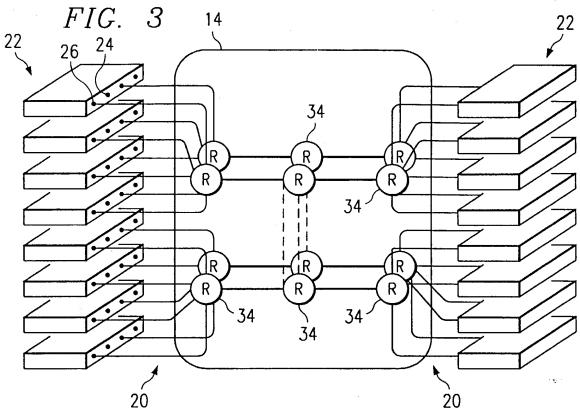
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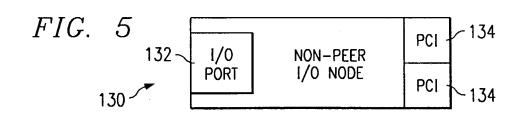


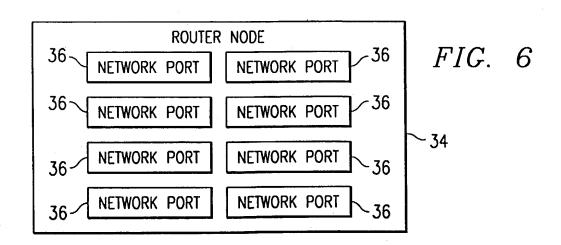


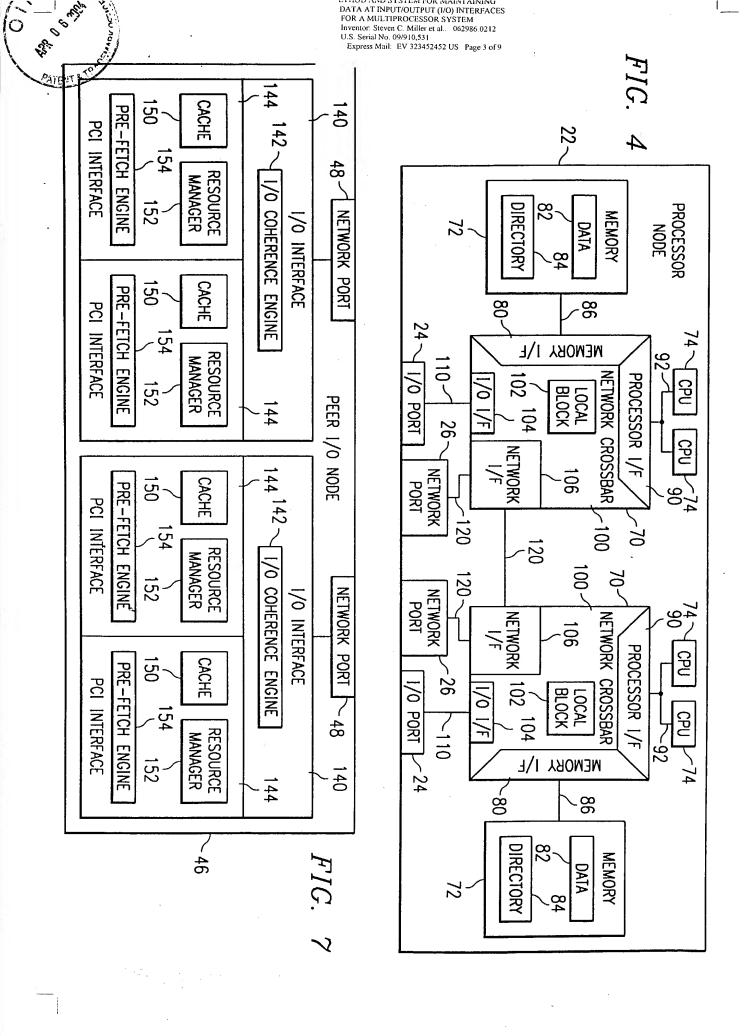
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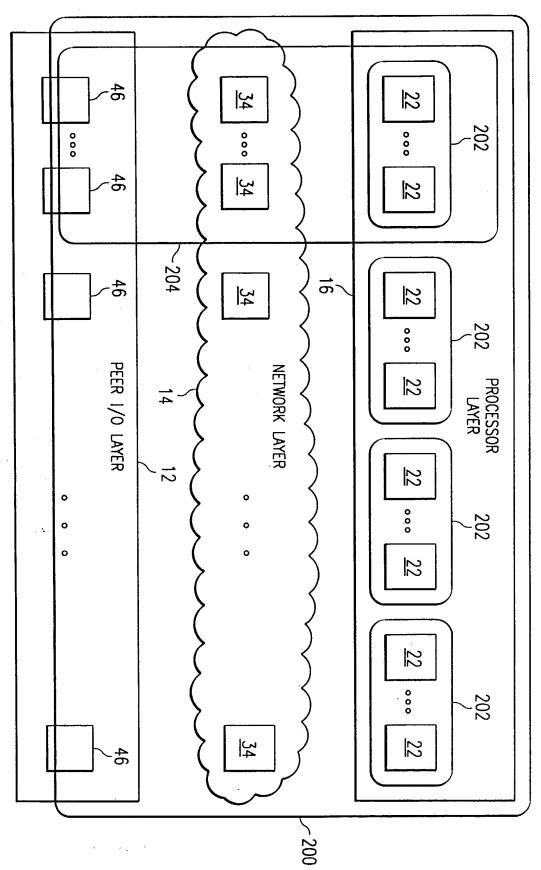




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ETHOD AND SYSTEM FOR MAINTAINING DATA AT INPUT/OUTPUT (I/O) INTERFACES FOR A MULTIPROCESSOR SYSTEM Inventor: Steven C. Miller et al. 062986.0212 U.S. Serial No. 09/910,531 Express Mail: EV 323452452 US Page 4 of 9

FIG. 8



DATA AT INPUT/OUTPUT (I/O) INTERFACES FOR A MULTIPROCESSOR SYSTEM Inventor: Steven C. Miller et al. 062986.0212 U.S. Serial No. 09/910,531 Express Mail: EV 323452452 US Page 5 of 9

900 902 904 906 DESCRIPTION **GROUP** NAME **READ** READ 910a SHARED READ SHARED RDSHD **RDEXC** READ EXCLUSIVE EXCLUSIVE READ-ONLY TIMED ₿910b **EXCLUSIVE** RDXRO EXCLUSIVE READ-ONLY UNTIMED RDXRN 910 **GET** READ INVALID 910c **GET** READ INVALID, FORCED **GETF** ATOMIC MEMORY OPERATION, READ **AMOR** 910d etc. NON-COHERENT READ NCRD WRBK WRITEBACK WRITEBACK, CONCURRENT READ OUTSTANDING WRBKR 912a IMPLICIT WRITEBACK EXCLUSIVE WRITEBACK IWE **RQSH** CEX DROP (RELINQUISH) CEX DROP, CONCURRENT READ OUTSTANDING RQSHR MRITE 912 **PUT** WRITE INVALIDATE 912b **PUT** CACHE LINE FLUSH **PFCL** ATOMIC MEMORY OPERATION, WRITE **AMOW** NON-COHERENT WRITE, DOUBLEWORD 912c ETC. NCWRD NON-COHERENT WRITE, CACHE LINE **NCWRF** }914a INTER INTERVENTION SHARED **SHARED INEXC** INTERVENTION EXCLUSIVE 914b **EXCLUSIVE FLUSH** FLSH 914 **ERASE ERASE** INTERVENTION INVALID ININV 914c **GET** INTERVENTION INVALID, FORCED ININF }914d INVAL **INVALIDATE** ETC. BACKOFF INVALIDATE ECHO, VECTOR FORMAT **BINEV** INVAL 916 **GENERATION** LOCAL BLOCK INVALIDATE VECTOR LINW

FIG. 9

ETHOD AND SYSTEM FOR MAINTAINING DATA AT INPUT/OUTPUT (I/O) INTERFACES FOR A MULTIPROCESSOR SYSTEM Inventor: Steven C. Miller et al. 062986.0212 U.S. Serial No. 09/910,531 Express Mail: EV 323452452 US Page 6 of 9

100		002	1004	1006  FIG.  7	OA
	GROUP		NAME	DESCRIPTION	
1010	READ	SHARED	SRPLY	SHARED REPLY	10100
			SRESP	SHARED RESPONSE	
			SACK	SHARED ACKNOWLEDGE	
			BINTR	BACKOFF INTERVENTION SHARED	
		EXCLUSIVE	ERPLY	EXCLUSIVE REPLY	1010b 1010c 1010d
			ESPEC	EXCLUSIVE SPECULATIVE REPLY	
			ERESP	EXCLUSIVE RESPONSE	
			EACK	EXCLUSIVE ACKNOWLEDGE	
			ERPYP	EXCLUSIVE REPLY, SEND PRGE	
			BIEXC	BACKOFF INTERVENTION EXCLUSIVE	
			BINW	BACKOFF INVALIDATE, VECTOR FORMAT	
			BINVP	BACKOFF INVALIDATE, POINTER FORMAT	
		GET	IRPLY	INVALID REPLY	
			ISPEC	INVALID SPECULATIVE REPLY	
			IRESP	INVALID RESPONSE	
			IACK	INVALID ACKNOWLEDGE	
			NACKG	NEGATIVE ACKNOWLEDGE TO GET	
			BIINV	BACKOFF INTERVENTION INVALID	
			BIINF	BACKOFF INTERVENTION INVALID FORCED	
		ETC.	AARP	AMO READ REPLY	
			NCRP	NON-COHERENT READ REPLY	
			NACK	COHERENT READ NEGATIVE ACKNOWLEDGE	
1012	WRITE	WRITEBACK	WBACK	WRITEBACK ACKNOWLEDGE	
			WBBACK	WRITEBACK BUSY ACKNOWLEDGE	
		PUT	WACK	WRITE INVALIDATE ACKNOWLEDGE	1012b
			WACKP		
			WNACK	WRITE INVALIDATE NEGATIVE ACKNOWLEDGE	
			1	1 1	
		· · · · · · · · · · · · · · · · · · ·			<del></del>

TO FIG. 10B

ETHOD AND SYSTEM FOR MAINTAINING DATA AT INPUT/OUTPUT (I/O) INTERFACES FOR A MULTIPROCESSOR SYSTEM Inventor: Steven C. Miller et al. 062986.0212 U.S. Serial No. 09/910,531 Express Mail: EV 323452452 US Page 7 of 9

1000

## FIG. 10B

FROM FIG. 10A

					<u>.</u>
	[	 			`
1012	WRITE	PUT	BFLSH	BACKOFF FLUSH	1012b
			BERSE	BACKOFF ERASE	10120
		ETC.	AWAK	AMO WRITE ACKNOWLEDGE	1012c
			NCWAK	NON-COHERENT WRITE ACKNOWLEDGE	10126
1014	PROBE	SHARED	SHWB	SHARING WRITEBACK	
			DNGRD	DOWNGRADE	1014a
			SHWBR	SHARING WRITEBACK, PRIOR WB PENDING	10140
			DNGDR	DOWNGRADE WITH PRIOR WB PENDING	
		EXCLUSIVE	PRGE	PURGE	
			XFER	OWNERSHIP TRANSFER	
			PRGER	PURGE WITH PRIOR WB PENDING	}1014b
			XFERR	OWNERSHIP TRANSFER, PRIOR WB PENDING	
			IWACK	IMPLICIT WRITEBACK RACE ACKNOWLEDGE	
		GET	IIACK	INTERVENTION INVALID ACK	}1014c
}		ETC.	IVACK	INVALIDATE ACK	}1014d
1016	ERROR		PERR	POISONED ACCESS ERROR	
			AERR	READ PROTECTION VIOLATION ERROR	
			WERR	WRITE PROTECTION VIOLATION ERROR	
		-	DERRR	DIRECTORY ERROR ON A READ REQUEST	
			DERRW	DIRECTORY ERROR ON A WRITE REQUEST	]



